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SYSTEM AND METHOD FOR MANAGING TIER-PRICED COMMODITIES  
TRANSACTIONS

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Field of the Invention

The present invention relates to a system and method for managing the sales of a commodity within a tiered pricing structure. More particularly, the present invention relates to a system and method for managing the risks and costs of delivering a commodity from less expensive tier by use of a financial instrument to indemnify against loss from risks associated with purchasing a commodity from that tier.

## Background of the Invention

Deregulation of the various utility industries is creating new opportunities for utility customers to reduce their cost of purchasing water, electricity, natural gas and telecommunications services. Traditionally, because of government regulation, customers in a given geographic area were restricted to purchasing their utilities from single sources (i.e. there was no choice as to where a consumer could buy his or her power, all of a consumer's electricity came from a single local electric utility). Today, most power (primarily electricity) customers rely on what is referred to as "firm" power provided by their local utility companies.

Considering electricity as an example, "firm electric power" means electricity is delivered to the customer on a non-interruptible high-priority basis (i.e. 24 hours a day, 7 days a week throughout the year). Electric utilities must supply electricity to its firm power customers on demand. Because of its guaranteed availability, this is the most expensive type of power a customer may purchase. An alternative to this is for the customer to purchase "interruptible power". Because interruptible power rates are generally substantially lower than firm power rates, the customer can realize a significant savings. The downside to the use of interruptible power by the customer is that it may not be available when the customer needs or wants it and therefore the customer or the customer's utility provider may be forced to buy power from an alternative source (also referred to as "spot" power). Spot power is typically much more expensive than interruptible or firm power (it may not be economically feasible for a

customer to buy spot power for short durations when their interruptible power is unavailable).

The distinction between interruptible electric power and firm electric power creates a two-tiered pricing structure for electricity as a commodity (there are additional sub-tiers such as industrial, retail, and utility-to-utility power). Traditionally, if an electric power customer wanted to take advantage of low cost interruptible power they would have to gamble that the additional costs due to having to purchase spot power during an interruption would not be greater than the savings attributed to using interruptible power. Because most interruptions in interruptible electric power are due to seasonal weather (heat in particular) changes it is possible to estimate from historical data how much spot power a customer may have to purchase during a given period of time.

One method of dealing with the risk interruptions would be to set aside, hopefully in some type of profitable investment, an amount of money equivalent to the estimated costs of purchasing spot power for the predicted interruptions. While a possible solution, this method would be difficult for the average utility customer to implement because of the lack of available information and skill with determining the frequency of interruptions. Another option, if available, would be to purchase interruptible power during the time of year when interruptions are unlikely and by firm power when interruptions are likely to occur. While better than purchasing nothing but interruptible power, this method does not provide the same savings as it is possible to realize using a larger percentage of interruptible power and it is still possible to be surprised by

SUMMARY OF THE INVENTION  
interruptions requiring the customer to buy spot power.

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What is needed is a system that allows the customer to buy less expensive interruptible from the least expensive power generating utility or broker and avoid the risk of loss of power. A method which combined the sale of interruptible power with a financial instrument designed to indemnify against loss resulting from foreseeable interruptions would achieve this goal. A system which allows the customer to purchase or contract with a power broker/utility via a computer connected to the Internet or similar network would also be highly desirable. It would also be advantageous if the system allowed the customer to compare purchase prices from several different providers in order to provide the customer with the best possible price. It would also be advantageous if the system allowed the customers to bid on available utility resources rather than paying a fixed rate, thereby allowing customers to realize a savings and utilities to efficiently sell off unused capacity.

#### ~~Summary of the Invention~~

One embodiment of the present invention teaches a method for managing the sales of a tier-priced commodity such as electricity. The method includes determining the prices of the commodity at the available tiers and determining the cost of a financial instrument to cover the cost of any loss incurred by the purchase of a commodity at a given tier. While the invention discussed herein may be applied to numerous tier-priced commodities and services for which there is a quality of service distinction (i.e. telecommunications bandwidth), the preferred embodiment discussed herein will focus on the management of the sales of electrical power.

In another embodiment of the present invention the transaction is carried about between the seller of electrical power and the customer, both wholesale (another utility, a municipality, rural cooperative or large manufacturing concern) and retail (individual consumers), via a seller's computer and a customers computer over a computer network.

Yet another preferred embodiment allows the customer, through the use of a personal computer, to compare the cost of a commodity from different sources and financial instruments from different sources which may be purchased to indemnify against loss caused by risks associated with the commodity from different sources.

Typically, the cost of the commodity and the financial instrument will vary depending upon the amount being purchased, the location of the customer, transportation variables, the capacity of the commodity provider and other factors.

These and other features and advantages of the present invention will be presented in more detail in the following specification of the invention and the accompanying figures which illustrate by way of example the principles of the invention.

### **Brief Description of the Drawings**

The present invention will be readily understood by the following detailed description in conjunction with the accompanying drawings in which:

Figure 1a is an overview description of the operational model of the present invention wherein a buyer purchases a combined commodity and financial instrument from a commodity seller.

Figure 1b is an overview description of the operational model of the present invention wherein a buyer purchases a commodity from a commodity seller and a financial instrument from a financial instrument broker.

Figure 2a illustrates one embodiment of the present invention in which a financial instrument is in place guaranteeing delivery of electrical power and there is no interruption.

Figure 2b illustrates one embodiment of the present invention in which a financial instrument is in place guaranteeing delivery of electrical power and there is an interruption.

Figure 3a illustrates one embodiment of the present invention in which a financial instrument is in place guaranteeing delivery of natural gas and there is no interruption.

Figure 3a illustrates one embodiment of the present invention in which a financial instrument is in place guaranteeing delivery of natural gas and there is an interruption.

Figure 4 is a flowchart illustrating the method steps of one embodiment the present invention.

Figure 5a is a diagram illustrating the use of a client computer to contact a commodity seller computer to carry out the present invention

Figure 5b is a diagram illustrating the use of a client computer to contact a commodity seller computer and a financial instrument seller computer to carry out the method of the present invention.

Figure 6 is a flowchart illustrating the method steps of one embodiment of the present invention.

Figure 7 is a diagram illustrating a multiple bid implementation of the system of the present invention.

Figure 8 illustrates the system of the present invention being used to solicit quotes from more than one seller.

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### Detailed Description of the Invention

Reference will now be made to the preferred embodiment of the invention. An example of the preferred embodiment is illustrated in the accompanying drawings. While the invention will be described in conjunction with that preferred embodiment, it will be understood that it is not intended to limit the invention to one preferred embodiment. On the contrary, it is intended to cover alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims. In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. The present invention may be practiced without some or all of these specific details. In other instances, traditional process operations have not been described in detail in order to not unnecessarily obscure the present invention.

In a tier-priced industry, the use of a financial instrument to guarantee commodity delivery and lower the cost of delivering the commodity can be implemented in two distinct ways. Fig. 1a illustrates a buyer 2 purchasing a tier-priced commodity 8 bundled with a financial instrument 10 from a commodity seller 4. In this example the buyer negotiates the purchase of the bundled commodity 8 and financial instrument 10

with the commodity seller **4**. The financial instrument **10** would be triggered and executed to absorb the additional costs of purchasing spot power under the conditions described in the financial instrument. In the preferred embodiment the tier-priced commodity is electrical power being sold by a generating utility or broker and the financial instrument is an insurance policy or hedging contract. The buyer **2** may be any consumer of the purchased commodity **8** (i.e. an individual, a large manufacturing concern, a rural cooperative, a municipality or another generating utility) and the seller **4** may be a commodity generating utility or commodity reseller. In one embodiment, the financial instrument **10** is offered by the commodity provider **4** along with the commodity **8** as a bundled product (the purchase price of the commodity includes the purchase price of the financial instrument used to guarantee the delivery of the commodity). Fig. 1b illustrates an alternative embodiment in which the buyer **2** purchases the financial instrument **10** and the commodity **8** separately. In this example the financial instrument **10** is purchased from a financial instrument broker **6** such as an insurance company (in the case of an insurance policy) or brokerage house (in the case of a hedging contract or derivative contract ).

Fig. 2a illustrates the use of an insurance policy **18** to protect against an interruption in service to a customer **16** (in this example a municipality). In Fig. 2a a municipality **16** purchases interruptible power from a generating utility **12**. The municipality **16** has also purchased an insurance policy **18** as part of a bundled product from the generating utility **12** or an insurance company such as the financial instrument broker **10** (See Fig. 1b). If there is no interruption in service then the municipality **16**



receives its power as contracted from the generating utility **12** and there is no need to purchase spot power from another utility **14** (or the power pool). Purchasing a commodity supported by an insurance policy **18** allows the municipality **12** to purchase power at a reduced interruptible rate. The insurance policy **18** takes effect if there is an interruption in service governed by the terms of the policy. Typically, the terms of the insurance policy will cover foreseeable interruptions and not force majeure events. The insurance policy **18** is designed to take into account the risks associated with purchasing interruptible power. These risks include historical data regarding the weather in and around the municipality **16** (the consuming area), the current/predicted future capacity of the generating utility **12** and the current/ predicted future demands of the municipality **16** (the load profile). If there is an interruption in service , the insurance policy **18** will provide the finances necessary to allow the generating utility **12** to purchase or generate needed power to supplement the interruption. In the case where the municipality **16** holds the insurance policy **18** (purchased it separately from the commodity) the financial proceeds of the policy are paid to the generating utility **12** or an alternative source **14** or a transmitting utility to augment supply by purchasing or generating additional power. Referring to Fig. 2b, with the insurance policy **18** covering the cost of purchasing expensive spot power, the alternative source **14** (the providing utility or power pool) would transfer the supplemental power to the municipality through the generating utility **12** or through another system (transmitting/distributing utility) depending upon the circumstances.

When a municipality **16** (or any customer for that matter) is the insurance policy holder, an agreement among the electricity provider, the insurance provider, and the end-user would be structured to provide interruptible power under a mutually acceptable set of circumstances. This agreement allows the generating utility **12**,  
5 through their trading floor, to purchase power for interruptions on behalf of the municipality **16** (including the end users), using funds provided by the insurance policy held by the municipality **16**. In an alternative embodiment the end-users would contract directly with the generating utility and the insurance provider.

Figs 3a and 3b illustrate the application of the present invention to the natural gas industry. A natural gas producer **20** provides gas to a national pipeline company **22** which is conceptually similar to the national electrical grid. The national pipeline company **22** provides gas to a local distributor **26** who in turn provides gas to the end-user **30**. In the event of an interruption in gas service (which are occasioned for equally predictable reasons as they are in the electrical industry) an insurance policy **28** (or  
15 other financial instrument) will provide the funds to supplement the interruption from an alternative source **24**.

5/3> The implementation of the present invention from the generating utility and end-user may be accomplished via traditional business means (typically written agreements) or via a computerized transaction. If the transaction is carried out over a computer  
20 network (via the Internet in the preferred embodiment), a wholesale or retail customer would be able to purchase the utility commodity from the provider either with or without an attached financial instrument. The purchaser would also be able to purchase the

commodity from one provider and the financial instrument from a separate financial broker. Sales by a utility may be conditioned upon the purchase of an insurance policy by the purchaser. In another embodiment, an alternative energy provider may sell hedge contracts supported by its own power generating surplus. In yet another embodiment purchasers bid on available power and financial instrument from a variety of different providers.

Fig. 4 illustrates the method steps of the present invention as they would be carried out through traditional processes or as implemented in software on one or more computers. At step 32 a price is determined for the commodity at a first tier. In the preferred embodiment, this will be the price for firm electrical power in a particular class (residential, industrial, etc.) which will be the most expensive electrical power available in that class. At step 34 the price for the commodity at a second tier within the same class. In the preferred embodiment, this will be interruptible power in the same class available for a substantially lower price than the power in the first tier. The price determinations made in steps 32 and 34 are accomplished using any of a number of well known techniques. One source of information useful in determining these prices is Federal Energy Regulatory Commission (FERC) Open-Access Same-time Information System (OASIS) provides information about available transmission capacity. At step 36 a price is determined for a financial instrument to cover the loss which would be suffered in the event of a foreseeable interruption in service associated with the purchase of the second tier commodity. Typically the financial instrument is designed to cover the potential foreseeable interruptions and not force majeure events.

However, coverage for force majeure events could be included in an alternative embodiment of the present invention. At step 38 the generating utility or broker offers the bundled commodity (interruptible power) and financial instrument (typically an insurance policy). The second tier commodity and indemnifying financial instrument are then sold to a customer at step 40.

Figs. 5a and 5b illustrate a system implementing the present invention over a computer network. A customer using customer computer 42 would connect to a commodity seller computer 46 via a computer network such as the Internet 44. The commodity seller computer 46 has access to commodity price data 48 and financial instrument price data 50. The price data may be stored on the commodity seller server 46 or another computer. Figure 5b illustrates a bifurcated system in which there is a financial instrument seller computer 52 in addition to the commodity seller computer 46. In the preferred embodiment the interface between the customer computer 42 and the commodity seller computer 46 and the financial instrument seller computer 52 is implemented as a web page accessible to the customer via the World Wide Web. In an alternate embodiment the customer would contact a brokering computer which would in turn contact the commodity seller computer 46 and the financial instrument seller computer 52.

Referring to Fig. 6, the method steps of the present invention are illustrated for an embodiment in which a customer is presented with the lower of two prices from two or more sources. At step 54 the price for a first tier commodity from a first source is determined. At step 56 the price for a second tier commodity from a first source is

determined. At step 58 a price is determined for a financial instrument to cover the loss which would be suffered in the event of a foreseeable interruption in service associated with the purchase of the second tier commodity from a first source. At step 60 the price for a first tier commodity from a second source is determined. At step 62 the price for a second tier commodity from a second source is determined. At step 64 a price is determined for a financial instrument to cover the loss which would be suffered in the event of a foreseeable interruption in service associated with the purchase of the second tier commodity from a second source. At step 66 the lowest combined price for a second tier commodity and bundled financial instrument is displayed to a customer and at step 68 the transaction is processed.

Fig. 7 illustrates an implementation of the present invention facilitating an online auction for a commodity and bundled financial instrument. A first bidder computer 70 and a second bidder computer 72 are connected via a computer network such as the Internet 74 to a tier-priced commodity transaction server 76. The tier-priced commodity transaction server 76 presents the first bidder computer 70 and the second bidder computer 72 a starting bids (personalized for each participating bidder) for a given commodity at a specified tier and an associated financial instrument. The potential bids are accepted by the tier-priced commodity transaction server 76 and the commodity and bundled financial instrument is sold to the highest bidder.

Fig. 8 shows customer computer 78 connecting to commodity seller computers 82, 84, and 86 via a network such as the Internet 80. The customer computer 78 presents the commodity seller computers 82, 84, and 86 with its commodity

requirements and information necessary to determine the cost of the requested commodity and the associated financial instrument. In an alternate embodiment the customer computer 78 connects to a querying computer which collects information from the customer retrieves the price combinations from the commodity seller computers 82, 84, and 86 and returns the best offer price to the customer. In yet another embodiment the querying computer contacts both commodity seller computers 82, 84, and 86 and financial instrument selling computers and presents the customer with the best combined price.

Although the foregoing invention has been described in some detail for the purpose of clarity of understanding, it will be apparent that certain changes and modifications may be practiced within the scope of the appended claims. Accordingly, the present embodiments are to be considered illustrative and not restrictive, and the invention is not to be limited to the details given herein, but may be modified within the scope and equivalents of the appended claims.